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LETTER OF TRANSMITTAL

Title of Abstract: Quantitation of Serum Erythropoietic Stimulatory and Inhibitory Activities Using ^{3}H-Thymidine Uptake by K562 Cells

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1. Lewis, J. P.	69	Ph.D.				X		
2. Felice, A. E.	38	M.D., Ph.D.	X					
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A

Name A. E. Felice, M.D., Ph.D.

Address Hemoglobin Research Laboratory, Medical Research Service, Veterans Administration Medical Center, Augusta, GA 30910

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QUANTITATION OF SERUM ERYTHROPOIETIC STIMULATORY AND INHIBITORY ACTIVITIES USING ^{3}H-THYMIDINE UPTAKE BY K562 CELLS.

J. P. Lewis* and A. E. Felice**, Hemoglobin Research Laboratory, Medical Research Service, Veterans Administration Medical Center, and Departments of Cell and Molecular Biology, Pediatrics, and Medicine, Medical College of Georgia, Augusta, GA.

Cells of the human pluripotent leukemia cell line K562 exhibit erythroid properties such as glycophorin and hemoglobin synthesis. We examined the response of K562 cells to erythropoietin in terms of ^{3}H-thymidine uptake as described by Krystal et al for spleen cells from anemic mice pretreated with phenylhydrazine (Exp. Hematol. 11: 649, 1983). Both murine spleen cells and K562 cells gave the same dose response curve, i.e. 10^3 cpm/10^3 cells/mU erythropoietin. Thus, the K562 cells could be used instead of the murine spleen cells in the Krystal assay for erythropoietic activity in serum. With this assay, nine healthy volunteers with normal blood counts gave erythropoietin levels of 356 ± 10 (SD) mU/ml. Sera of 24 children with sickle cell disease gave levels between 289 and 1835 mU/ml (average is 589 ± 66 (SD) mU/ml). Addition of an anti-erythropoietic inhibitory factor antiserum, or dilution of sera led to increased ^{3}H-thymidine uptake. Thus, ^{3}H-thymidine uptake reveals the presence of physiological erythropoietin receptors on K562 cells and can be used to measure erythropoietic and anti-erythropoietic activities in sera of patients.

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Revised October 1986